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Bullying victimization and later anxiety and depression among pre-adolescents in Switzerland

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Abstract: Purpose - The purpose of this paper is to investigate the relationship between bullying victimization at age 8 and anxiety and depression at age 11 in a large and ethnically heterogeneous sample from Zurich, Switzerland. Design/methodology/approach - The authors present new analyses from the Zurich Project on the Social Development of Children and Youth (z-proso) on the relationship between bullying victimization at age 8 and anxiety and depression at age 11. Findings - Different measures of bullying victimization significantly predicted later anxiety and depression. Differences existed between measures of anxiety and depression from different informants. Originality/value - First, the paper provides readers with an overview of the victimization data collected in z-proso among an ethnically heterogeneous population sample of children in Zurich, Switzerland. Second, it provides results of bivariate and multivariate analyses on the relationship between bullying victimization and internalizing behavior. Third, the authors investigate if their results are robust across different measures of bullying victimization and across measures of anxiety and depression from different informants.

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Bullying victimization and later anxiety and depression among pre-adolescents in Switzerland

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Abstract

The current study investigated the relationship between bullying victimization at age 8 and anxiety and depression at age 11 in a large and ethnically heterogeneous sample from Zurich, Switzerland. Different measures of bullying victimization significantly predicted later anxiety and depression. Differences existed between measures of anxiety and depression from different informants. Explanations are discussed.

Key words. Bullying, victimization, internalizing behavior, anxiety and depression, childhood.

In this paper, we present new analyses from the Zurich Project on the Social Development of Children (*z-proso*) on the relationship between bullying victimization at age 8 and anxiety and depression at age 11. In line with the purpose of the current special issue, our aim is largely data-centered and three-fold. First, we provide readers with an overview of the victimization data collected in *z-proso* among an ethnically heterogeneous population sample of children in Zurich, Switzerland. Second, we provide results of bivariate and multivariate analyses on the relationship between bullying victimization and internalizing behavior. Third, we investigate if our results are robust across different measures of bullying victimization and across measures of anxiety and depression from different informants.

Method

Participants

The data were drawn from an ongoing combined longitudinal and intervention study, the Zurich Project on the Social Development of Children (*z-proso*). The study is sampling a large, ethnically heterogeneous population of 7-year-olds in Switzerland.

The target population for the study consisted of all 2,520 children who entered the first grade of public primary school in Zurich in 2004. Because the interventions occurred at the school level, a cluster randomized approach was used for the sampling, with schools as the units of randomization. The sample was drawn from all 90 public primary schools in Zurich. A sample of 56 schools was drawn, stratified by enrollment size and socioeconomic background of the school district. The final sample consisted of all 1,675 children who started primary school in one of the 56 schools (see Eisner and Ribeaud, 2005).

Written informed consent for the participation of all respondents was obtained from the parents. Computer assisted personal parent interviews were conducted with the primary caregiver (usually the mother) at the respondent's home. Computer-assisted personal child assessments were

conducted at school. In wave 4, children completed a written questionnaire. The child's teacher completed a written questionnaire.

The sample consisted of 52% boys. The average age of the children at the first child interview was 7.45 years ($SD = 0.39$). Eleven percent of the children were born outside of Switzerland, and in 46% of the cases both parents were born outside of Switzerland. All contact letters and parent interviews were translated into the nine most frequently spoken foreign languages.

In wave 1 (conducted in 2004/5), the response rate was 81% for the children ($N = 1,361$), 74% for the parents ($N = 1,240$), and 81% for the teachers ($N = 1,350$). In wave 2 (2005/6), when the children were 8 years old, the retention rate was 95% for the parents, 97% for the children, and 96% for the teachers. In wave 4 (2008/9), when the children were 11 years old, the retention rate was 86% for the parents, 83% for the children, and 92% for the teachers. We did not use data from wave 3 since we wanted to estimate the longer-term relationship between bullying (wave 2) and internalizing problems (wave 4).

Measures

Internalizing behavior. We used the Social Behavior Questionnaire (SBQ) (Tremblay *et al.*, 1991) to collect data from the children, parents, and teachers about child internalizing behavior. The items focus on anxiety and depression (e.g., "The child cries a lot"). Responses were recorded on a 5-point Likert scale. Cronbach's α was .79 for the parents (nine items; range .00 – 3.33, $M = .90$, $SD = .53$), .90 for the teachers (seven items; range .00 – 4.00, $M = .89$, $SD = .74$), and .79 for the children (eight items; range .00 – 3.63, $M = 1.04$, $SD = .66$). A cross-informant measure was computed by standardizing and averaging the informant-specific measures (range -1.49 – 3.60, $M = -.01$, $SD = .65$).

Bullying victimization. The bullying self-report scale was derived from Olweus (1993) and included in the wave 2 child interview. Questions were supported by pictures (Perren & Alsaker, 2006). The scale ($\alpha = .65$) covered four types of bullying by other children: teasing, stealing and destroying possessions, physical violence, and rejection (e.g., excluding one from playing with

others). Answer categories ranged from 1 to 5 and indicated whether the child was bullied ‘never’, ‘once or twice’, ‘more than twice’, ‘at least once per week’, or ‘(almost) every day’ since the school year had started, which was on average about three months before the child interview. The answer categories represent a Likert scale but no evidence was found that the variables did not behave as interval-level variables.¹

We computed three different bullying victimization variables. First, an *intensity* variable returned the maximum value across the types of bullying (range 1 – 5, $M = 2.67$, $SD = 1.23$). Second, a *variety* variable gave the number of different bullying types a child had experienced (range 0 – 4, $M = .98$, $SD = 1.13$). In order to exclude occasional incidents (Olweus, 1993), victimization of a particular type was defined as having been bullied more than twice, at least once per week, or (almost) every day since the school year had started. Third, a *combined intensity and variety* variable returned the sum of the bullying frequency across all bullying types (range 4 – 20, $M = 7.34$, $SD = 2.98$). Child attrition between waves 2 and 4 was not related to prior anxiety and depression or bullying variety, but it was related to bullying intensity ($OR = 1.14$, $p < .05$).

Control variables. Control variables were derived from prior literature on both bullying and child anxiety and depression. All control variables were measured in wave 1, before the measurement of bullying (wave 2) since controls measured at the same time as bullying may mediate the relationship between bullying and internalizing behavior (Murray, Farrington, & Eisner,

¹ Formula used:
$$\frac{\frac{SSE' - SSE}{C - 2}}{\frac{SSE}{n - p}} \sim F_{1-\alpha}^{(C-2, n-p)}$$
, where SSE' represents the Sum of Squared Errors of a regression with

the original ordinal variable for intensity (‘risky’ regression model), SSE represents the Sum of Squared Errors of a regression where the ordinal variable is replaced by four dummies for each level of frequency (and one dummy as the reference category; ‘safe’ regression model), C represents the number of levels in the frequency variable, p represents the number of parameters used in the ‘safe’ regression model, n represents the sample size, and $1-\alpha$ represents the level of confidence (α was set to .95) (McDaniel, 1996).

2009). *Prior anxiety and depression* measured propensity for internalizing problems (data were based on the same informant as the dependent variable). *Academic competence* was based on the teacher's perception of the child's competence in calculation and reading. *Competent problem solving* was based on children's responses to potential conflict situations. *Non-average height* indicated whether the child was somewhat or much taller or smaller than children of his age. *Weight* indicated the extent to which the child was overweight. *Negative parenting* was measured through the Alabama Parenting Questionnaire (Shelton, Frick, & Wootton, 1996) and included poor monitoring, erratic parenting, and corporal punishment (19 items; $\alpha = .65$). *Maternal depression* measured the number of quarters in which the primary caregiver had felt depressed during the first seven years of the child's life. We also included *sex*, presence of *siblings*, socioeconomic status (*SES*; International Socio-Economic Index of parental occupational status; Ganzeboom, Degraaf, Treiman, & Deleeuw, 1992), *age of mother at birth*, and *single parenthood*.²

Clustering. Given that levels of bullying may differ between classes (e.g. due to level of supervision; Olweus, 1993), standard errors were corrected for clustering within classes.

Results

Table 1 provides an overview of the frequency of different types of bullying victimization. Teasing and rejection happened most frequently. Eight percent of the children were teased at least once a week, and about 5% almost daily, while half of the children had not been teased. Regarding rejection, almost half (47%) of the children were not affected. About 5% were rejected at least once a week; about 2% were rejected daily. Theft and vandalism were less common, with about 3% of the children reporting this form of bullying at least once a week and about 1% more often. In

² In order to test whether the receiving of prevention programs affected results, we performed additional analyses in which we included a dummy for the received intervention. Results were very similar. We also performed additional analyses that included control variables for prior aggression by the respondent and prior bullying victimization (both measured at wave 1). Again, results were very similar.

contrast, the majority (58%) never had anything stolen or destroyed. The share of children who were victims of physical violence by peers is somewhat higher. About 6% of the children got hit, bitten, kicked, or their hair pulled at least once a week, and about 3% almost daily. At the same time, slightly more than half (53%) of the children never were the victim of peer violence.

-- table 1 --

Although bullying victimization did not necessarily refer to bullying at school, follow-up questions that asked about the location of the last bullying incident reveal that most of the bullying occurred in school or on school premises. Almost half (46%) of the incidents happened in the schoolyard, while substantial percentages happened in the classroom (10%) and during sports or swimming lessons or in a wardrobe (10%). Only 17% of incidents occurred in the neighborhood, during organized leisure activities, or elsewhere.

Table 2 shows the results of the regressions of anxiety and depression at age 11 on bullying victimization at age 8. As outcomes we used separate parent, child, and teacher reports of anxiety and depression and a combined parent-child-teacher report. Separate regressions were run for the effects of intensity, variety, and the combined bullying score for each informant (Models I to III). Each regression analysis was conducted three times: once with the bullying measures as predictors only, once with early risk factors added ('level' model), and once with early risk factors and prior anxiety and depression added ('change' model). The latter model predicted changes in anxiety and depression between ages 7 and 11 from victimization and therefore better controlled for unobserved heterogeneity. Models I show that intensity and variety of bullying victimization were significantly related to child anxiety and depression three years later. The more frequently a child was bullied and the more different types of bullying (s)he experienced at age 8, the more anxious and depressed (s)he was at the age of 11. Most results held when early risk factors were included ('level' model). When prior anxiety and depression was included ('change' model), the significant effects of the combined bullying score and the intensity score on parent reported internalizing problems

disappeared, and in general effect sizes decreased. Overall, given the range of the dependent variables, effect sizes were modest.

-- table 2 --

For the combined parent, teacher, and child report of bullying intensity, we also investigated whether it was associated with levels of internalizing behavior that may be considered particularly high (see strategy NICHD, 2003). We computed dichotomous variables with a 1 for children who scored more than 1 SD above the mean of internalizing behavior, and with a 0 for other children, corresponding to cut-offs at the 84th percentile. Adjusted proportions from logistic regressions show that the proportion of high-rate children increased as bullying intensity increased (Table III). The proportion of children with high levels of internalizing behavior was substantially higher amongst the most frequently bullied group (.202) than amongst the never bullied group (.121). However, even among those who were frequently bullied, the large majority was not in the high-rate range.

-- table 3 --

Our final analyses concerned the relationship between different types of bullying and internalizing problems. Table 3 shows the results of multivariate regressions of the combined child-parent-teacher report of anxiety and depression at age 11 on different types of bullying at age 8. In the ‘level’ model, higher frequencies of physical violence and rejection, but not teasing and stealing or destroying, were significantly related to anxiety and depression. Results held in the ‘change’ model, although effect sizes decreased. Thus, children who experienced physical violence and children who were rejected by their peers were more anxious and depressed three years later.

-- table 4 --

Discussion

In line with other studies on the relationship between bullying and internalizing problems, our analyses with data from the Zurich Project on the Social Development of Children (*z-proso*) showed that being bullied is related to anxiety and depression. The frequency of bullying and the

number of different types of bullying both had a unique contribution. The relationship was still traceable three years after the bullying took place and it held when early risk factors were taken into account. Given the range of the dependent variables however, effect sizes were modest. Effect sizes decreased when we considered the relationship between bullying and *changes* in anxiety and depression over time. This indicates that some of the effects found in the ‘level’ models may be due to an unmeasured propensity for internalizing problems.

Outcome data on anxiety and depression from different informants yielded somewhat different results. The effects of bullying were significant for children, teacher, and combined reports of anxiety and depression, but not for parent reports (in the ‘change’ models). Prior research has shown that different informants may not agree on a child’s internalizing behavior, especially when the informants see the child in different settings (Achenbach, McConaughy, & Howell 1987). Our teacher reports of anxiety and depression referred to the school context, which was also the context in which bullying often occurred. Parent’s observations referred to the home context and may therefore capture another aspect of internalizing problems (Cole, Truglio, & Peeke, 1997). Child reports of bullying and internalizing problems came from the same informant and may share method variance. Child reports furthermore may reflect internalizing problems in both the home and school context. Hence, it is important for future studies to collect information among different respondents to capture the relationship between bullying and child internalizing problems.

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Tables

Table 1. Incidence of bullying victimization

	Teasing	Stealing/destroying	Physical violence	Rejection
1. Never	680 (50.9%)	777 (58.2%)	710 (53.2%)	628 (47.0%)
2. Once or twice	203 (15.2%)	348 (26.1%)	270 (20.2%)	355 (26.6%)
3. More than twice	252 (18.9%)	143 (10.7%)	224 (16.8%)	251 (18.8%)
4. At least once per week	107 (8.0%)	43 (3.2%)	73 (5.5%)	60 (4.5%)
5. (Almost) every day	72 (5.4%)	11 (.8%)	43 (3.2%)	32 (2.4%)
Missing	21 (1.6%)	13 (1.0%)	15 (1.1%)	9 (0.7%)
Total	1,335 (100%)	1,335 (100%)	1,335 (100%)	1,335 (100%)

Table 2. Regression results on the relationship between bullying victimization and anxiety and depression across different informants (coefficients are unstandardized *B*'s (standard errors)).

Anxiety and depression at age 11										
		Parent reports			Child reports			Teacher reports		
Model	Bullying at age 8	Without controls	With controls ^a 'Level'	With controls ^b 'Change'	Without controls	With controls ^a 'Level'	With controls ^b 'Change'	Without controls	With controls ^a 'Level'	With controls ^b 'Change'
Model I	Intensity score	.046** (.014)	.041** (.014)	.020 (.014)	.061** (.016)	.067** (.018)	.057** (.017)	.092** (.019)	.068** (.018)	.055** (.018)
Model II	Variety score	.032* (.016)	.027 (.016)	.007 (.016)	.070** (.018)	.088** (.019)	.079** (.019)	.106** (.019)	.083** (.019)	.072** (.019)
Model III	Combined intensity/variety score	.020** (.006)	.018** (.006)	.008 (.006)	.028** (.007)	.034** (.008)	.030** (.008)	.047** (.008)	.038** (.007)	.032** (.007)

** $p < .01$ * $p < .05$ (two-tailed)

^a Controls measured at age 7 include academic competence, competent problem solving, non-average height, weight, negative parenting, maternal depression, sex, siblings, SES, age of mother at birth, and single parenthood.

^b Controls measured at age 7 include the same as under ^a plus prior anxiety and depression.

Table 2 (continued).

Anxiety and depression at age 11				
Combined parent, teacher, and child reports				
Model	Bullying at age 8	Without controls	With controls ^a	With controls ^b
			'Level'	'Change'
Model I	Intensity score	.094** (.016)	.087** (.016)	.063** (.016)
Model II	Variety score	.097** (.017)	.098** (.018)	.076** (.018)
Model III	Combined intensity/variety score	.044** (.007)	.044** (.007)	.034** (.007)

Table 3. Adjusted proportions (se) of ‘high-rate’ anxiety and depression (scores of at least 1 SD above the mean) for different intensities of bullying.

Bullying	Proportion of high-rate anxiety and depression
	Combined parent, teacher, and child reports
Never	.121 (.217)
Once or twice	.108 (.211)
More than twice	.151 (.164)
At least once per week	.151 (.225)
(Almost) every day	.202 (.260)

Note. Proportions are adjusted for academic competence, competent problem solving, non-average height, extent of being overweight, negative parenting, maternal depression, sex, siblings, SES, age of mother at birth, single parenthood, and prior anxiety and depression.

Table 4. Regression results on the relationship between types of bullying victimization and anxiety and depression (coefficients are unstandardized *B*'s (standard errors)).

Anxiety and depression at age 11		
Combined child, parent and teacher reports		
Bullying at age 8 (frequency)	With controls ^a 'Level'	With controls ^b 'Change'
Teasing	.038 (.020)	.023 (.020)
Stealing, Destroying	.015 (.025)	.003 (.025)
Physical violence	.063** (.022)	.059** (.021)
Rejection	.053* (.022)	.042* (.021)

** $p < .01$ * $p < .05$ (two-tailed)

^a Controls measured at age 7 include academic competence, competent problem solving, non-average height, weight, negative parenting, maternal depression, sex, siblings, SES, age of mother at birth, and single parenthood.

^b Controls measured at age 7 include the same as under ^a plus prior anxiety and depression.